

R09**Code: 9ABS102**

B.Tech I Year (R09) Supplementary Examinations December/January 2015/2016

ENGINEERING PHYSICS

(Common to all branches)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Discuss various methods by which polarized light can be produced.
(b) What are Quarter and Half wave plates?
(c) Calculate the thickness of half wave plate of quartz for a wavelength 500nm. Here $\mu_e = 1.553$ and $\mu_o = 1.544$.
- 2 (a) State and explain Bragg's law.
(b) What are Miller Indices? Draw (1 1 1) and (1 1 0) planes in a cubic lattice.
(c) Calculate the interplanar spacing for (3 2 1) planes in a simple cubic crystal whose lattice constant is 4.2 A.U.
- 3 Explain the following:
(a) Heisenberg's uncertainty Principle.
(b) De Broglie hypothesis of matter waves.
(c) Physical significance of wave function.
- 4 (a) Explain the detailed mechanism of current conduction in n- and p-type semiconductors.
(b) Describe the working of Photodiode and light emitting diode.
- 5 (a) Explain the salient features of Ferrimagnetism.
(b) The susceptibility of paramagnetic FeCl_3 is 3.7×10^{-3} at 27°C . What will be the relative permeability at 500K?
- 6 (a) Explain the construction and working of Ga-As laser with neat diagrams.
(b) What are the advantages of Ga-As laser?
- 7 (a) Discuss the minimization of modal dispersion in the graded index optical fiber.
(b) An optical fiber has a numerical aperture of 0.20 and cladding refractive index of 1.59. Determine the refractive index of core and the acceptance angle for the fiber in water which has a refractive index of 1.33.
- 8 (a) Explain the magnetic properties exhibited by carbon nanotubes.
(b) Explain the basic factors of carbon nanotubes on which its magnetic properties depends.
